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UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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*Ex parte* ROBERT WHITE, GRAHAM JOHN SIMMS, and  
KEVIN L. POWELL

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Appeal 2009-000650  
Application 10/692,136  
Technology Center 3700

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Decided: November 19, 2009

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*Before:* WILLIAM F. PATE, III, JENNIFER D. BAHR, and STEFAN  
STAICOVICI, *Administrative Patent Judges.*

BAHR, *Administrative Patent Judge.*

DECISION ON APPEAL

## STATEMENT OF THE CASE

Robert White et al. (Appellants) appeal under 35 U.S.C. § 134 (2002) from the Examiner's decision rejecting claims 17-24 and 26. We have jurisdiction over this appeal under 35 U.S.C. § 6 (2002).

### *The Invention*

Appellants' claimed invention is directed to a method of making a cutting element for a blade unit of a safety razor. Spec. 1:2-4. "A safety razor generally comprises a blade unit having at least one blade with a cutting edge which is moved across the surface of the skin being shaved by means of a handle to which the blade unit is attached." *Id.*, 1:4-6. According to Appellants, "[t]he shaving performance of a razor blade unit is dependent not only on the sharpness of the blade(s), but on the disposition of the blade(s) in relation to other parts of the blade unit which normally contact the skin during shaving." *Id.*, 1:12-14.

Claim 17, reproduced below, is representative of the claimed subject matter.

17. A method of making a cutting element for a safety razor blade unit comprising the steps of providing a wafer of single crystal material having a surface lying in a predetermined plane of the crystallographic structure, selectively removing crystal material at the surface by employing an etching process to form a planar cutting element inclined at an acute angle to the surface plane and having a sharp cutting edge substantially at the surface plane, and forming a guard element from the wafer of single crystal material by the etching process, said guard element being disposed substantially parallel to the cutting edge and spaced forwardly therefrom and being integrally

connected to the cutting element by  
interconnecting elements.

### *The Rejections*

The Examiner relies upon the following as evidence of  
unpatentability:

Trotta	US 5,018,274	May 28, 1991
Marcus	US 5,842,387	Dec. 1, 1998
Erdmann (as translated)	DE 35 26 951 A1	Jan. 29, 1987

Appellants' Admitted Prior Art (AAPA), Spec. 3:30 to 4:23 (admitting that dry etching and isotropic etching are well known).

Appellants seek review of the Examiner's rejections under 35 U.S.C. § 103(a) of claims 17, 18, 20-22, 24, and 26 as being unpatentable over Trotta and Erdmann; claims 19 and 23 as being unpatentable over Trotta, Erdmann, and AAPA; and claims 17-24 and 26 as being unpatentable over Trotta and Marcus.

## SUMMARY OF DECISION

We AFFIRM.

## ISSUES

In rejecting claims 17, 18, 20-22, 24, and 26 as being unpatentable over Trotta and Erdmann, the Examiner concluded that it would have been obvious to use an etching process on a wafer of single crystal material, as taught by Erdmann, for forming cutting elements to make a cutting blade as described by Trotta. *See* Ans. 4.

Appellants contest the Examiner's finding (Ans. 4) that Trotta's blade includes a guard element 21. App. Br. 6.

Appellants argue that combination of Trotta and Erdmann would not result in the method of claim 17 because Erdmann's cutting edges 12 are not positioned at the surface plane (the top surface) of Erdmann's blade. App. Br. 6. According to Appellants, because Erdmann's shearing blades function differently from the wet shaving blades of Trotta, there is no reason to include a sharp edge at the surface plane. App. Br. 6 and 9. Appellants further argue that replacing the blades of Trotta with the shearing foil of Erdmann would drastically alter the structure of Trotta's blade, thus rendering the cutting elements non-acute. App. Br. 9.

Appellants additionally argue that a person of ordinary skill in the art would not have had a reasonable expectation that the Erdmann etching process would provide adequate sharpness to the cutting edge for use in Trotta's wet shaving blade. App. Br. 10.

Finally, Appellants argue that, even if Trotta and Erdmann could be combined as proposed by the Examiner, there is no motivation or suggestion to combine them, because, based on Trotta's teachings, the artisan would have believed Trotta's process to be economical, and would have seen no reason to attempt to simplify it. App. Br. 7-8.

Appellants do not present any separate arguments for the patentability of claims 18, 20-22, 24, and 26 apart from claim 17. Accordingly, for purposes of our review of the rejection based on Trotta and Erdmann, these claims stand or fall with claim 17. *See* 37 C.F.R. § 41.37(c)(1)(vii) (2007).

Appellants rely on their arguments directed to claim 17 in contesting the rejection of claims 19 and 23 as being unpatentable over Trotta, Erdmann, and AAPA. App. Br. 10. Accordingly, our conclusion with

respect to the rejection of claim 17 as being unpatentable over Trotta and Erdmann will likewise be dispositive as to the rejection of claims 19 and 23.

In rejecting claims 17-24 and 26 as being unpatentable over Trotta and Marcus, the Examiner concluded that it would have been obvious to form a safety razor blade cutting element of the type described by Trotta using an etching process for making a cutting element from a wafer of single crystal material as taught by Marcus. Ans. 5.

In contesting the rejection, Appellants argue, *inter alia*, that the blade embodiments disclosed by Marcus do not provide for cutting blades with planar blade surfaces, as disclosed by Trotta, and as required in claim 17. App. Br. 14. Thus, according to Appellants, “Marcus does not disclose or even suggest that this etching process could be used to create a honeycombed structure having angled and [planar] cutting elements as disclosed by Trotta.” *Id.*

Accordingly, the following issues are presented for our consideration:

1. Have Appellants demonstrated that the Examiner erred in finding that Trotta’s blade 14 includes a guard element, as called for in claim 17?
2. Have Appellants demonstrated that the Examiner failed to articulate a reason with rational underpinning for combining the etching technique of Erdmann with the cutting blade unit of Trotta?
3. Have Appellants demonstrated that a person of ordinary skill in the art would not have had a reasonable expectation that an etching technique of the type taught by Erdmann could be used to form the cutting elements of a wet shaving blade as described by Trotta with cutting edges of adequate sharpness, and thus would not have been prompted to make the combination proposed by the Examiner?

4. Have Appellants demonstrated that a person of ordinary skill in the art would not have had a reasonable expectation that the etching process of Marcus could be used to create the honeycombed structure having angled, planar cutting elements as disclosed by Trotta, and thus would not have been prompted to make the combination proposed by the Examiner?

#### FACTS PERTINENT TO THE ISSUES

- FF1 Appellants disclose that their unitary blade structure includes a guard element 15 “which is parallel to the blades and lies between the first blade 11 and the guard member 3 of the frame in the assembled blade unit so that this guard element 15 determines the span and the exposure of first blade 11.” Spec. 7:4-7. *See* figs. 2 and 3.
- FF2 The bottom strip of blade material, the bottom face of which is designated with the reference numeral 21 in figure 4 of Trotta, lies parallel to the blades and is positioned to lie between the first blade (defined between the bottom two rows of cells 18 in figure 4) and a guard member of the frame of the assembled razor head. Further, this strip of material determines the span and exposure of the first blade, in much the same manner as Appellants’ disclosed guard element 15 (*see* FF1).
- FF3 Trotta discloses a safety razor blade 14 that is manufactured by providing a honeycombed block 16 of ceramic material capable of being extruded into the shape shown in figure 3 in its green or uncured condition, slicing a portion P from the block at an

acute angle to form blade 14, curing the blade, grinding and polishing the blade to form a plurality of sharpened edges 30, and coating the blade with a coating of platinum chrome and a telomer coating to produce a blade having cutting edges 30 “which are adequately sharp” and have the necessary wearability for a durable shaving instrument. Trotta, col. 2, l. 63 to col. 3, l. 35.

- FF4 Trotta characterizes the invention disclosed therein as providing a safety razor blade that is simple to manufacture and lends itself to mass production techniques. Trotta, col. 3, ll. 56-58.
- FF5 As pointed out by the Examiner (*see* Ans. 6), Erdmann teaches that the technique of forming a blade by etching a single crystal silicon disk produces a blade with improved cutting quality and longer life expectancy by means of a single etching process. Erdmann 2.
- FF6 The Examiner concluded that Erdmann’s teaching that the etching technique produces a blade with improved cutting quality and longer life expectancy (*see* FF5) would have motivated a person of ordinary skill in the art to replace the blade forming process described by Trotta with the etching process taught by Erdmann. Ans. 6.
- FF7 Erdmann’s etching process involves etching both upwardly from the bottom surface, and downwardly from the top surface, using photoresist 3 to form etch-masks defining the windows 4 and 5. Erdmann 3, fig. 1a. Erdmann’s etching process causes the edges of the hole formed by the etching to run toward each



- other in such a way that the hole narrows, as depicted by displayed directions 6, 7, and 8 in figure 1a. Erdmann 3.
- FF8 Erdmann alludes to “cutting edges 12” formed on a lower surface of the blade removed from the top surface. Erdmann 3, fig. 1b. Erdmann makes no reference to any cutting edges disposed at the top surface of the blade. Indeed, the particular etching pattern utilized by Erdmann results in acute angle structures (cutting edges 12) only on the bottom surface, and in obtuse angle structures on the top surface, at the edges of window 4.
- FF9 As correctly noted by the Examiner, given the narrowing hole-forming effect of Erdmann’s etching process (*see* FF7), and the two-sided etch application (*see id.*), a person of ordinary skill in the art would have readily appreciated that parallel, angular cutting element surfaces, such as along depicted directions 6 and 8 in figure 1a, can be formed using Erdmann’s etching process by applying photoresist masking in appropriate locations. Such a process would produce sharp, acutely angled, cutting edges at both the top and bottom surfaces of the blade.
- FF10 Erdmann characterizes the cutting edges produced by the etching technique as being “sharp” and “of diamond-like quality.” Erdmann 2, 3.
- FF11 The declaration of Uwe Sievers relied upon by Appellants states that Trotta’s wet shaving blade and Erdmann’s shearing blade have different types of edges intended for different purposes (para. 3), and that the Erdmann edge could be quite

blunt (para. 5). The Sievers declaration, however, notably does not state that Erdmann's etching process is incapable of producing cutting edges of adequate sharpness for use in forming a blade as described by Trotta.

FF12 All of the etched knife blade structures disclosed and illustrated by Marcus have non-planar surfaces. *See, e.g.*, Marcus, figs. 11-13, 15, 17, 22, 31-33, 39, 42, 43, 50, 51, and 54. The Examiner has not pointed to any teaching in Marcus that indicates or suggests that the etching process of Marcus is capable of producing inclined, planar cutting elements, as disclosed by Trotta (fig. 4), and required by claim 17.

## PRINCIPLES OF LAW

### *Claim Construction*

When claim terminology is construed in the United States Patent and Trademark Office, claims are to be given their broadest reasonable interpretation consistent with the specification, reading claim language in light of the specification as it would be interpreted by one of ordinary skill in the art. *In re Am. Acad. of Sci. Tech. Ctr.*, 367 F.3d 1359, 1364 (Fed. Cir. 2004).

### *Obviousness*

Rejections on obviousness grounds must be supported by “some articulated reasoning with some rational underpinning” to combine the known elements in the manner required in the claim at issue. *KSR Int’l. Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007). However, “the analysis need not seek out precise teachings directed to the specific subject matter of the

challenged claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ.” *Id.*

When a work is available in one field of endeavor, design incentives and other market forces can prompt variations of it, either in the same field or a different one. If a person of ordinary skill can implement a predictable variation, § 103 likely bars its patentability. For the same reason, if a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill.

*Id.* at 417. We must ask whether the improvement is more than the predictable use of prior art elements according to their established functions. *Id.*

While the demonstration of a teaching, suggestion, or motivation (the TSM test established by the Court of Customs and Patent Appeals) to combine known elements in order to show that the combination is obvious may be “a helpful insight,” it cannot be used as a rigid and mandatory formula. *Id.* at 418-19.

Obviousness does not require that all of the features of the secondary reference be bodily incorporated into the primary reference. *See In re Keller*, 642 F.2d 413, 425 (CCPA 1981). Likewise, the artisan is not compelled to blindly follow the teaching of one prior art reference over the other without the exercise of independent judgment. *Lear Siegler, Inc. v. Aeroquip Corp.*, 733 F.2d 881, 889 (Fed. Cir. 1984).

An expert’s opinion on the legal conclusion of obviousness is neither necessary nor controlling. *Avia Group Intern., Inc. v. L.A. Gear Inc., Calif.*,

853 F.2d 1557, 1564 (Fed. Cir. 1988). While it is proper to give some weight to a persuasively supported statement of one skilled in the art on what was not obvious to him, obviousness is a question of law which we must decide. *See In re Weber*, 341 F.2d 143, 145 (CCPA 1965); *In re Vamco Machine and Tool, Inc.*, 752 F.2d 1564, 1574-75 (Fed. Cir. 1985).

### ANALYSIS

Consistent with Appellants' Specification (*see* FF1), we construe "guard element," as used in Appellants' claim 17, to be a unitary part of the blade structure which lies parallel to the blades at one end of the unitary blade structure so that, when assembled into the frame, the guard element lies between the first blade and the guard member of the frame and thus determines the span and exposure of the first blade.

Like the "guard element 15" described in Appellants' Specification (*see* FF1), the bottom strip of blade material, the bottom face of which is designated with the reference numeral 21 in figure 4 of Trotta, lies parallel to the blades and is positioned to lie between the first blade (defined between the bottom two rows of cells 18 in figure 4) and a guard member of the frame of the assembled razor head. FF2. Further, this strip of material determines the span and exposure of the first blade, in much the same manner as Appellants' disclosed guard element 15 (*see* FF1). FF2. Accordingly, the Examiner did not err in finding that this strip of blade material of Trotta's blade is a "guard element" as called for in claim 17.

Appellants' argument that there is no motivation or suggestion to combine the etching technique of Erdmann with the cutting blade unit of Trotta is not convincing. First, as noted above, the Supreme Court has stated

that a rigid insistence on teaching, suggestion, or motivation is incompatible with its precedent concerning obviousness. *KSR*, 550 U.S. at 419. Moreover, while Trotta characterizes the safety razor blade disclosed therein as being simple to manufacture and lending itself to mass production techniques (*see* FF4), that fact alone would not have discouraged a person of ordinary skill in the art from attempting to improve either the blade or the process of making the blade. Erdmann teaches that the technique of forming a blade by etching a single crystal silicon disk produces a blade with improved cutting quality and longer life expectancy by means of a single etching process. FF5. The Examiner concluded that this teaching by Erdmann would have motivated a person of ordinary skill in the art to replace the blade forming process described by Trotta with the etching process taught by Erdmann. FF6.

The Examiner's conclusion is well reasoned. Despite the recognized differences in structure and operation between Trotta's wet shaving blade and the shearing blade of Erdmann (*see* FF11), a person of ordinary skill in the art would have readily appreciated that the benefits of improved cutting quality and longer life expectancy offered by Erdmann's etching technique would likewise improve the shaving blade of Trotta, while still affording the simplicity of a single etching process. Accordingly, the Examiner has articulated a reason with rational underpinning for combining the etching technique of Erdmann with the shaving blade of Trotta.

We likewise are not persuaded that, because of the positioning of Erdmann's cutting edges 12, combination of Trotta and Erdmann, as proposed by the Examiner, would not result in the method of claim 17. This argument is directed to the teachings of Erdmann alone, and not in

combination with Trotta, as proposed by the Examiner. Nonobviousness cannot be established by attacking the references individually when the rejection is predicated upon a combination of prior art disclosures. *See In re Merck & Co. Inc.*, 800 F.2d 1091, 1097 (Fed. Cir. 1986). The Examiner has not proposed replacing the blade of Trotta with the shearing blade of Erdmann. Rather, the Examiner's rejection proposes using an etching process, as described by Erdmann, to form the blade of Trotta. Erdmann alludes to "cutting edges 12" formed on a lower surface of the blade removed from the top surface, and makes no reference to any cutting edges disposed at the top surface of the blade. FF8. Indeed, the particular etching pattern utilized by Erdmann results in acute angle structures (cutting edges 12) only on the bottom surface, and in obtuse angle structures on the top surface, at the edges of window 4. *Id.* As correctly noted by the Examiner, however, given the two-sided etch application and the narrowing hole-forming effect of Erdmann's etching process (*see* FF7), a person of ordinary skill in the art would have readily appreciated that parallel, angular cutting element surfaces, such as along depicted directions 6 and 8 of figure 1a, can be formed using Erdmann's etching process by applying photoresist masking in appropriate locations. FF9. Such a process would produce sharp, acutely angled, cutting edges at both the top and bottom surfaces of the blade. *Id.*

Appellants' argument that a person of ordinary skill in the art would not have had a reasonable expectation that an etching technique as taught by Erdmann could be used to form sufficiently sharp cutting elements is not persuasive. While the declaration of Uwe Sievers relied upon by Appellants states that Trotta's wet shaving blade and Erdmann's shearing blade have different types of edges intended for different purposes, and that the

Erdmann edge could be quite blunt, the Sievers declaration notably does not state that Erdmann's etching process is incapable of producing cutting edges of adequate sharpness for use in forming a blade as described by Trotta.

FF11. Erdmann's description of the cutting edges produced by the etching technique as being "sharp" and "of diamond-like quality" (*see* FF10), in the absence of evidence to the contrary, is sufficient to support the Examiner's finding that a person of ordinary skill in the art would have had a reasonable expectation of success in using such a technique to form a safety razor blade as described by Trotta. Moreover, to the extent that the etching process itself produced cutting edges that were not adequately sharp to suit the purposes of Trotta's blade, a person of ordinary skill in the art could impart the necessary sharpness by applying the known grinding, polishing, and coating steps described by Trotta (*see* FF3).

The Examiner's rejection of claim 17 as being unpatentable over Trotta and Marcus is grounded on the conclusion that the combined teachings of Trotta and Marcus would have prompted a person of ordinary skill in the art to form a safety razor blade cutting element of the type described by Trotta using an etching process for making a cutting element from a wafer of single crystal material as taught by Marcus. Appellants' argument that Marcus does not disclose or suggest that the etching process could be used to form the type of honeycombed structure having angled and planar cutting elements disclosed by Trotta is convincing. All of the etched knife blade structures disclosed and illustrated by Marcus have non-planar surfaces. FF12. The Examiner has not pointed to any teaching in Marcus that indicates or suggests that the etching process of Marcus is capable of producing inclined, planar cutting elements, as disclosed by Trotta (fig. 4),

and required by claim 17. *Id.* Accordingly, the combined teachings of Trotta and Marcus are insufficient to establish that a person of ordinary skill in the art would have had a reasonable expectation that the etching process of Marcus could be used to create the honeycombed structure having angled, planar cutting elements as disclosed by Trotta, and thus would have been prompted to make the combination proposed by the Examiner.

### CONCLUSIONS

1. Appellants have not demonstrated that the Examiner erred in finding that Trotta's blade 14 includes a guard element, as called for in claim 17.
2. Appellants have not demonstrated that the Examiner failed to articulate a reason with rational underpinning for combining the etching technique of Erdmann with the cutting blade unit of Trotta.
3. Appellants have not demonstrated that a person of ordinary skill in the art would not have had a reasonable expectation that an etching technique of the type taught by Erdmann could be used to form the cutting elements of a wet shaving blade as described by Trotta with cutting edges of adequate sharpness, and thus would not have been prompted to make the combination proposed by the Examiner.
4. Appellants have demonstrated that, based on the record before us, a person of ordinary skill in the art would not have had a reasonable expectation that the etching process of Marcus could be used to create the honeycombed structure having angled, planar cutting elements as disclosed by Trotta, and thus would not have been prompted to make the combination proposed by the Examiner.



Accordingly, we sustain the rejections of claims 17, 18, 20-22, 24, and 26 as being unpatentable over Trotta and Erdmann; and claims 19 and 23 as being unpatentable over Trotta, Erdmann, and AAPA. We do not sustain the rejection of claims 17-24 and 26 as being unpatentable over Trotta and Marcus.

#### DECISION

The Examiner's decision is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a). *See* 37 C.F.R. § 1.136(a)(1)(iv) (2007).

#### AFFIRMED

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